NOTE VII.

ON THE VARIETIES OF ACTIAS MAENAS, Doubld.

BY

R. VAN EECKE.

(With four plates and one text-figure).

A very beautiful and by no means common species of *Saturnidae* of the tropical region is *Actias maenas.* In the year 1847 Doubleday has bestowed this name upon a female and a year later a male has been named *Actias leto* by the same author (Annals of Nat. Hist. vol. 19, pag. 95; Transactions Entom. Soc. London, vol. 5, pag. li). Doubleday's female type originates from Silhet, the male from India Orientalis (very undefinite!). It was unknown to Doubleday and also to Walker, that *maenas* and *leto* belong to the same species, the latter giving in the List of spec. of the British Mus. (pag. 1263) a diagnosis of a male *Tropaea maenas.* After Rothschild's publication it is unquestionable that the species ought to be named „*maenas*" and that „*leto*" is a mere synonym.

In the East-Indies the females, which differ very much from the males, seem to be decidedly more numerous than the males. This we understand from the rearing experiments by the late Dr. H. W. van der Weele and from those in the Zoological Gardens at Amsterdam. The Leyden Museum possesses also twice more females than males. The same may be the case in British-India. On the other hand on Celebes the males of a variety seem to be more numerous than the females (Deutsche Entomologische Zeitschrift „Iris", Jahrg. 1909, pag. 24).

The females are not so variegated as the males, which latter I may divide into two groups: one where greenish yellow is the prime-colour and one with red-brown as prime-colour. Between these principal groups is a third one, which shows us the transitional form. Mr. Fruhstorfer has given to this variation from Celebes the name „*latona*". Its coloration resembles that of *Argema (Actias) ignescens* Moore from the Andaman-islands (Sonthonnax), and Mr. G. Weymer utters the opinion, that *latona* and *ignescens* will be synonym. The dark specimens are all from Celebes, the other ones from Java and Sumatra. Between the female, described by Doubleday and figured by Westwood (Cab. Oriental Entomology, plate 22) and those of Java and Sumatra is some difference; the males also are not quite identical, so that I believe, there are four local varieties of *Actias maenas*.

1. *Actias maenas*, Doubleday (type, British-India).
2. *Actias maenas*, Var. *saja*, n. v. (Java and Sumatra).
3. *Actias maenas*, Var. *latona*, Fruhst. i. l. (Celebes).
4. *Actias maenas*, Var. *isis*, Sonth. (Celebes).

When the evolution-theory is true, we have in this species a very fine proof of the transition from dark brown into greenish yellow. The form *latona*, which Sonthonnax and Weymer had united with *isis*, shows us a very interesting colour-transition. The females are more advanced in colour development than the males.

Here follows the description of these varieties.

Actias maenas, Doubleday.

♂. Hab. Sikkim. Exp. alar. 156 mM.

Anterior wing exp.: 72—75 mM.; the apex acute. The anteriormargin straight, slightly bent towards the apex; outermargin feebly undulated, slightly bent inside to media 1; innermargin 38—43 mM. Prime-colour greenish yellow; costa grayish brown; the base beyond the origin of the first nervule pale brown; a brown patch near the apex and a larger one on the outermargin near the distal angle; an indistinct pale brown, angular, transverse line beyond the middle, nearer to the lunule. Inside the top of the cell is a black line, outside an orange one, forming together a lunule on the crossvein. Below the forewing is pale yellow and has three brown spots, one on the apex, which is very dark, one ocellus under the lunule and a large one near the distal angle.

Posterior wing: expanse 145 mM., triangular, the anal angle produced into a long tail; tail 103 mM.. Prime-colour greenish yellow; tail and outermargin pale brown; flag yellow. Parallel with the outermargin a narrow angular line, and in the centre, just on the top of the cell, an ocellus with a partially black outline. Near the base a pale brown band.

The underside is paler and has about the same pattern as the upperside. Frons yellow; prothorax grayish brown, passing into red-brown; meso- and metathorax and the abdomen on the upperside greenish yellow, on the underside yellowish white; the stigmata are bordered with gray; femora yellowish white; tibiae and tarsi grayish brown.

♀. Doubleday's description of the female of *Actias maenas* is also good for the specimens from the East-Indies. The Leyden Museum possesses 8 examples. The females of the four variations of males are very little variegated. But there is a figure in the Cabinet of Orient. Entom. (plate 22), which shows us a very interesting form. This moth differs very much from all the specimens, which I have at my disposal. Size, shape, pattern and, last not least, the two blue-gray minute lines on the prothorax are quite different! Westwood writes: "The accompanying figure of this very fine insect is copied from a spec. kindly communicated for representation by W. W. Saunders, Esq., F. L. S., which differs in some respects from Mr. Doubleday's description of the spec., recently published". Locality? I fear, the picture is not well done, so that I will pass over it.

Actias maenas, Var. *saja*, n. v.

♂. Hab. Solok (Sumatra) and Preanger (Java). Exp. alar. 167 mM.

Anterior wing exp.: 80 mM.; apex acute. The anterior margin straight, slightly bent towards the apex; outermargin hardly undulated, slightly bent inside to media 1; innermargin 40 mM. Prime-colour greenish yellow; costa gray and brown; a pale brown band near the base, which is yellow; a brown patch near the apex; starting from this spot to another large one on the outermargin near the distal angle, a waving, narrow at the beginning, pale red-brown line. Parallel with this striga is another distinct, angular, narrow one, between the lunule and the distal patch. The end of the cell is marked by a large crescent-shaped lunule, dark internally and on the outline. Below, the forewing is very pale yellow coloured; of a basal band there is nothing to see; the patch near the apex is very dark brown; the waved line to the brown patch near the distal angle is distinctly traced. The lunule is replaced by an ocellus.

Posterior wing: exp. 160 mM.; tail 113 mM. long and 3 mM. broad, enlarged before the apex. Prime-colour greenish yellow; tail and outermargin dark red-brown. Parallel with the outermargin a narrow angular striga; near the base an irregular brown little band, which diffuses to the tail. On the cell an ocellus. On the underside the hindwing is paler coloured and has the same pattern as the upperside, the brown near the base however is wrinkled into a dark brown line. Frons yellow; prothorax brown; meso- and metathorax and the abdomen greenish yellow on the upperside and pale yellow on the underside. Stigmata bordered with gray; femora yellowish white; tibiae and tarsi grayish brown.

This variety resembles very much the type of Doubleday.

♀. The female of var. *saja* has the following measures: exp. alar. 180 mM.; exp. forewing 85 mM.; exp. hindwing 160 mM.; tail 100 mM.; innermargin of the forewing 50 mM.; the tail is broad 6 mM. The foremargin firstly straight, then rounded towards the apex; outermargin little bent inside till media 1, undulated; distal angle rounded towards the innermargin. The general colour is pale greenish yellow; the costa, except at the apex, ferruginous gray to the outside; outermargin from radius 2 till cubita 2 faintly rufescent. Near the base a transverse narrow band of the same colour, and beyond the middle a hardly visible undulated streak. The large lunule on the top of the cell is half (inside the cell) black and half citrine with a red-brown outline. The lunule in the females is not so strongly bent into the base as in the males. Posterior wing of the same colour as the anterior, outermargin of the wing and of the tail red-brown; in the middle the tail is sparsely sprinkled with grayish red-brown. On the top of the cell is an ocellus with a frontal piece of the outline black. The tail is very wrinkled at the extremity.

Below: in the anterior wings the basal striga is absent, the lunule is changed into an ocellus and the undulated line is more distinct, as it also is on the posterior wings. The colour is paler.

Frons yellow; prothorax grayish red-brown, passing into red-brown; meso- and metathorax greenish yellow; the abdomen pale yellow. Femora yellow; tibiae and tarsi grayish red-brown.

The Leyden Museum also possesses two females with the following measures: exp. alar. 139 mM.; exp. anterior wing 67 mM.; innermargin 35 mM.; exp. posterior wing 112 mM.; tail 67 mM.

The third variety has been named by Mr. Fruhstorfer:

Actias maenas, Var. *latona* Fruhst. i. l.

Fruhstorfer has separated this variation from the following, which has been described by Sonthonnax in: Essai de classification des lépidoptères producteurs de soie, Vol. 2, pag. 14. G. Weymer writes in: Deutsche Ent. Zeitschrift „Iris", Jahrg. 1909, pag. 25, the following: „Die Mehrzahl der Exemplare hat grössere goldgelbe Flecke vor und hinter dem Halbmondfleck der Vorderflügel bezw. dem Augenflek der Hinterflügel, sowie mehrere gelbe Schattierungen in der Nähe der Wurzel und vor der Spitze der Vorderflügel und auch eine äussere zackige gelbe Querbinde über beide Flügel. Diese Färbung kommt der *Argema* (*Actias*) *ignescens*, Moore von den Andamanen sehr nahe, welche Sonthonnax loc. cit. Taf. 4 Fig. 1 nach einem Exemplar des britischen Museums abbildet und pag. 14 ebenfalls beschreibt". The specimen in the collection of Messrs. Piepers and Snellen, corresponds with this description. For clearness' sake I will repeat, that the prime-colour is red-brown; that there are yellow spots above and beneath the lunule, which is half black and half red; that there is beyond the middle a distinct yellow flexuous streak, also on the anterior wing, which has a red ocellus with a dark outline. Below, the colour is greenish yellow with grayish brown undulated clouds near the outermargin. The lunule is replaced by a dark ocellus. The stigmata are not bordered with gray! The rest is like in the other males.

The female of this variety will probably be like that of the following:

Actias maenas, Var. *isis*, Sonth.

The female is very rare; it is not represented in our Museum. *Latona* and *isis* seem to be localized on the island of Celebes. The male in our collection corresponds with the description given by Sonthonnax of a specimen in the collection of Staudinger.

♀. The prime-colour is red-brown; in the cell of the forewing a small yellow spot at the basal angle and a ditto larger one near to the top; above the lunule, which is like in *latona*, a larger yellow spot is present. Except a trace of a flexuous yellow streak, there are some little yellow spots on the anterior- and posterior-wings. The underside is citrine with grayish red-brown near the outermargin. On the stigmata is a gray zigzag streak.

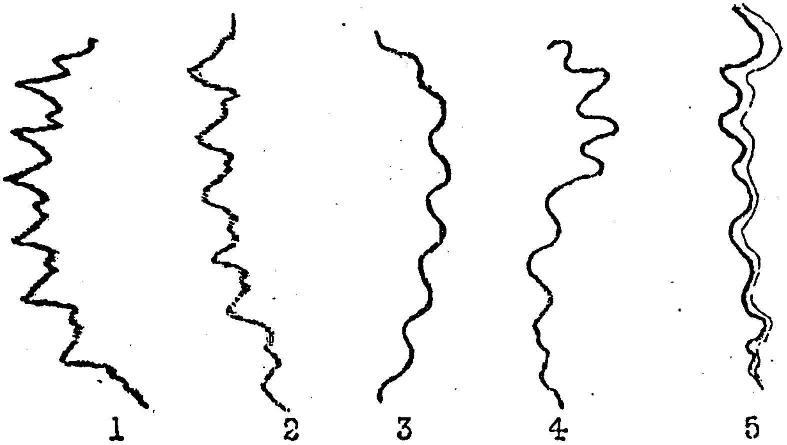
As to the female, I translate the description of G. Weymer, who possesses one specimen from Celebes.

♀. It is as large as *A. maenas*, has the same greenish yellow prime-colour and similar pattern, but the outermargin of the forewing is bent inward on rib 5—7, so that the apex on rib 8 is more protruding. The top of the lunule is more pulled down to the base, the distinct brown band near the base starts straightly from $^2/_5$ of the foremargin to $^2/_5$ of the innermargin, the brown flexuous streak behind the lunule does not lie in the middle between the latter and the outermargin, but nearer to the lunule, so that the distance between streak and outermargin is twice that between streak and lunule. Before the apex in the anterior margin is a long spot; before the innerangle in cells 1b, 2 and 3 are three little round violet spots. Outermargin violet-brown.

On the posterior margin the distinct brown basal band is in the middle between base and ocellus and starts to the dark violet-brown tail. The outer, brown, flexuous transverse streak is indistinct near the ocellus and joins the basal band. The undulated violet-brown margin becomes distally broader and joins also the dark tail. Tail 7 mM.; $^2/_3$ is violet-brown, much darker than that of *maenas*, the flag is pale yellow with violet-brown on a part of the margin. Ocellus identical with that of *maenas*.

Below the prime-colour is paler, bands near the base absent, lunule replaced by an ocellus, which is not so large as that on the posterior-wing. The two ocelli on the underside are coloured like those of the hindwing on the upperside, but a little paler. The flexuous streak on the wings is nearer to the outermargin than that of the upperside. The outermargin is covered with a grayish red dust, more intensively on the anterior-wings than on the posterior-ones. The tail is wrinkled at the extremity; it is grayish red, except the last little part.

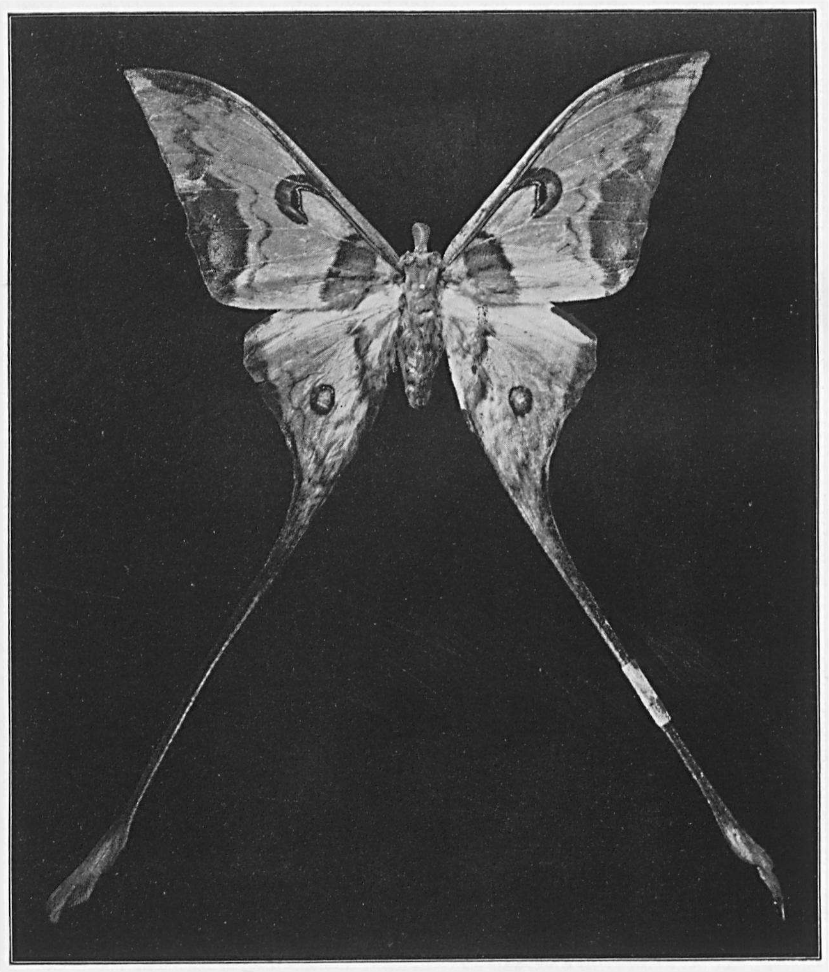
Finally I will say, that there must have been a fifth variation, according to the four degrees of transition from red-brown to yellow, which was entirely dark red-brown with four figures on the tops of the cells. The variety *isis* is the eldest one, that is to say, these moths have retained longer their original colour. The females are very highly developed; the males show us several degrees of colour transition. It is also my opinion, that the lunules and the ocelli are the focus of the colour-development. From these centres the yellow begins to practice usury on the red-brown and follows a natural line of division. This line is in this genus the flexuous transverse streak, parallel with the outermargin. So it is important, how the streak is running. Here follow five sketches of this streak in the described varieties.



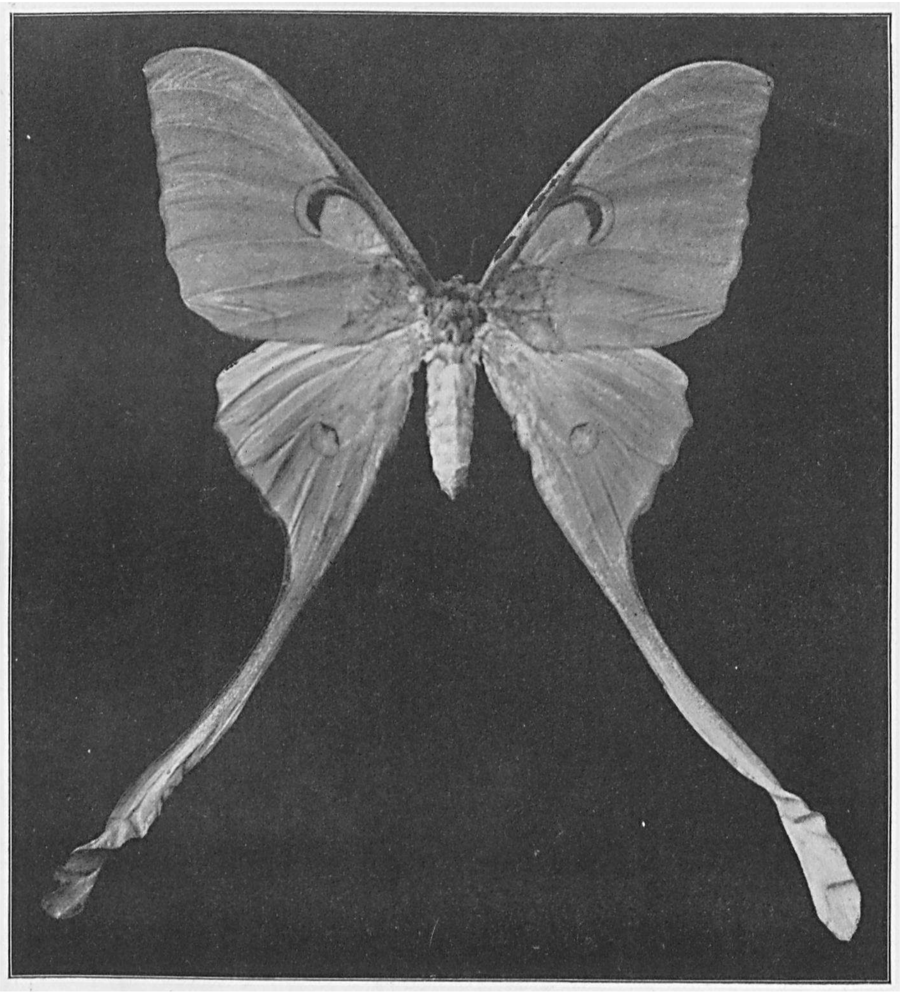
1. Streak on forewing of *A. maenas* ♀, fig. by Westwood.
2. Streak on forewing of *A. maenas*, Doubl. ♀ and of *A. maenas*, Var. *saja* ♀.
3. Streak on the underside of Var. *saja* ♀.
4. Streak on the forewing of *A. maenas*, Doubl. ♂ and of *A. maenas*, Var. *saja* ♂.
5. Streak on forewing of Var. *latona*, Fruhst. ♂ and of *isis*, Sonth. ♂.

I finish suggesting that naturalists will pay more attention to this *Saturnid*, which will be a very good object for rearing experiments. It is a pitty that it is so difficult to have these moths brought over.

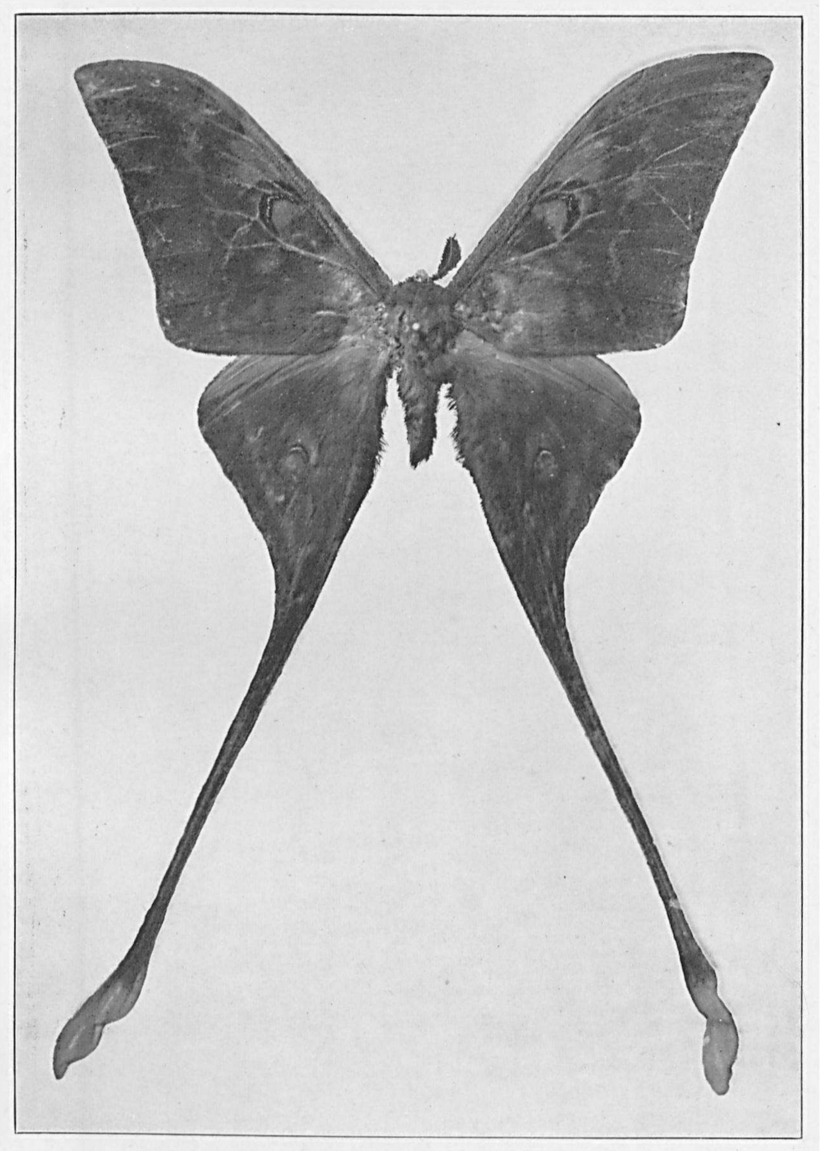
Leyden Museum, Jan. 8, 1913.



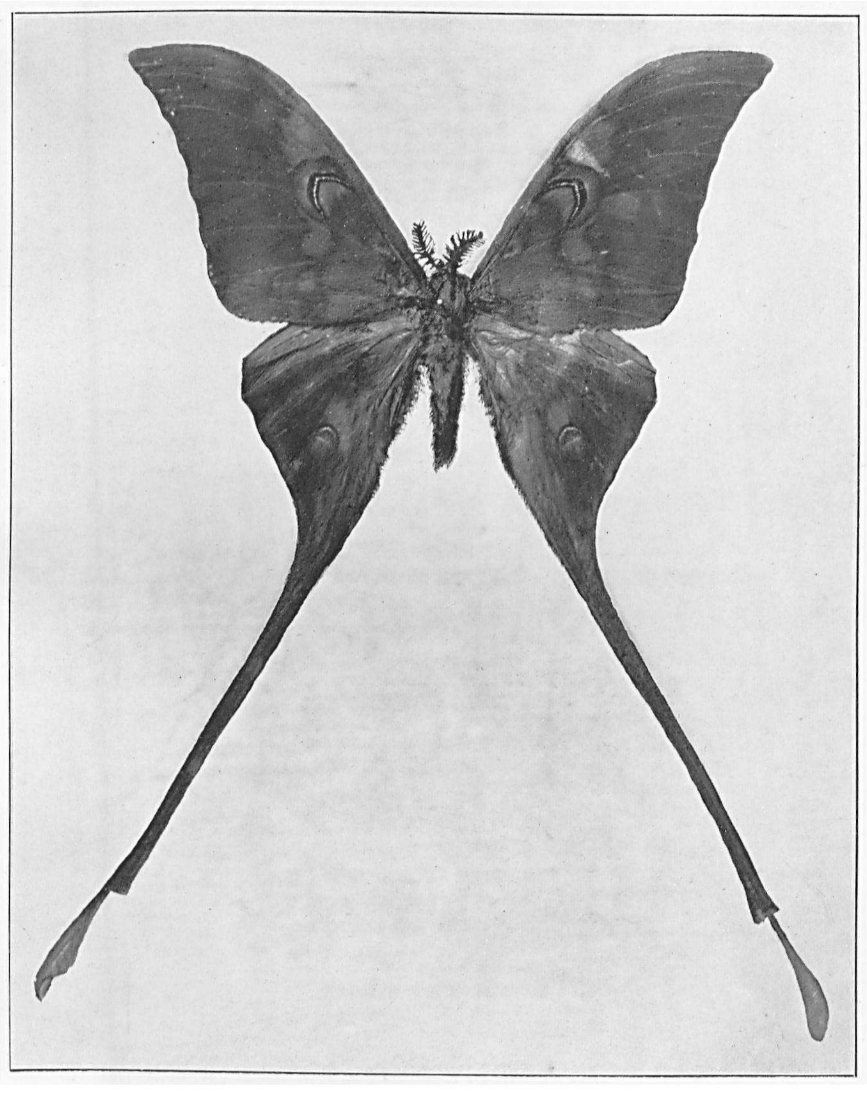
♂. *Actias maenas*, Doubl. Var. *saja*, v. Eecke. ($^9/_{16}$ nat. size).
Solok (Sumatra).



♀. *Actias maenas*, Doubl. Var. *saja*, v. Eecke. ($^{10}/_{11}$ nat. size).
Tjintjiroean (Java).



♂. *Actias maenas*, Doubl. Var. *latona*, Fruhst. ($^5/_7$ nat. size).
Celebes.



♂. *Actias maenas*, Doubl. Var. *isis*, Sonth. (± 5/6 nat. size).
Celebes.